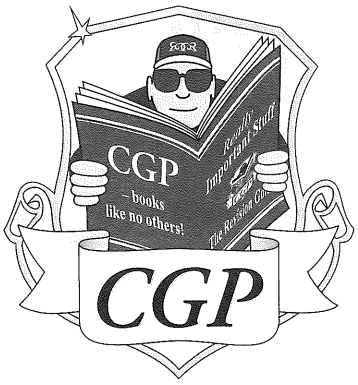

Head Start to A-Level Physics

A-Level Physics is a **big step up** from GCSE... no doubt about that. But don't worry — this CGP book has been lovingly made to help you **hit the ground running** at the start of your A-Level (or AS-Level) course.

It recaps everything you'll need to remember from GCSE, and introduces some of the crucial concepts you'll meet at A-Level. For every topic, there are **crystal-clear study notes** and plenty of **practice questions** to test your skills.

What's more, it's fully up-to-date for the **new A-Level courses** starting in 2015.

What CGP is all about

Our sole aim here at CGP is to produce the highest quality books — carefully written, immaculately presented and dangerously close to being funny.

Then we work our socks off to get them out to you — at the cheapest possible prices.

Contents

Section 4 — Electricity

Section 5 — Waves

Section 6 — Atoms and Radioactivity

Section 7 — Investigating and Interpreting

Published by CGP

Author:
Richard Tattersall

Editors:
David Maliphant
Rachael Marshall
Sam Pilgrim

ISBN: 978 1 78294 281 8

With thanks to Sarah Williams for the proofreading.
With thanks to Laura Jakubowski for the copyright research.

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Printed by Elanders Ltd, Newcastle upon Tyne.

Based on the classic CGP style created by Richard Parsons.

Symbols and Units

At A-Level, you're expected to use **standard scientific notation**. This means using **conventional symbols** and **units**, and writing very large and very small numbers in **standard form**.

The table below lists the different quantities you'll come across in this book, with their standard symbols and units:

Quantity	Symbol	Unit
Displacement (distance)	s	metre, m
Time	t	second, s
Velocity (speed)	v	metre per second, ms^{-1}
Acceleration	a	metre per second squared, ms^{-2}
Mass	m	kilogram, kg
Force	F	newton, N
Gravitational field strength	g	newton per kilogram, $N kg^{-1}$
Energy	E	joule, J
Work	W	joule, J
Power	P	watt, W
Frequency	f	hertz, Hz
Wavelength	λ	metre, m
Charge	Q	coulomb, C
Electric current	I	ampere, A
Potential difference	V	volt, V
Resistance	R	ohm, Ω

At A-Level, units like m/s are written ms^{-1}.
This is just **index notation**.
(If it doesn't make sense to you, look up 'rules of indices' in a maths book.)

Standard form lets us write **very big** or **very small** numbers in a more convenient way. It looks like this:

$A \times 10^n$

A must be between 1 and 10

n is the number of places the decimal point moves

For example:
53100 can be written as $\mathbf{5.31 \times 10^4}$,
and $\mathbf{2.5 \times 10^{-3}}$ is the same as **0.0025**.

You might also see large or small numbers given in units with these prefixes:

Multiple	Prefix	Symbol
10^{12}	tera	T
10^9	giga	G
10^6	mega	M
10^3	kilo	k
10^{-2}	centi	c
10^{-3}	milli	m
10^{-6}	micro	μ
10^{-9}	nano	n
10^{-12}	pico	p
10^{-15}	femto	f

Make sure you give your answers to questions to a sensible number of **significant figures**.
An easy way to do this is by always rounding your answers to the **same number** of significant figures as the given data value you've used in the calculation with the **least** significant figures.
Then **write** the number of significant figures you've rounded your answer to:
e.g. $2 \div 3.5 = 0.571... =$ **0.6 (to 1 s.f.)**
(2 is to 1 s.f., 3.5 is to 2 s.f., so the answer needs to be given to 1 s.f.)